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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/995,690 | 11/29/2001 | James Y.C. Chang | 1875.1210003/RES/JTH | 9803 |

28393 7590 10/24/2005

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| EXAMINER | |
|---|---|
| PHAM, TUAN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2643 | |

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/995,690 | CHANG, JAMES Y.C. | |
| | Examiner | Art Unit | |
| | TUAN A. PHAM | 2643 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,5,6,9 and 10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5,6,9, and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed on 08/04/2005 have been fully considered but they are not persuasive.

In response to applicant's remark on page 5, Applicant argues that the Chadwich et al. reference (U.S. No.: 4,628,518) does not teaches "to reduce flicker noise being generated inside the mixer circuit" in claims 1, and 6.

In response to applicant's arguments against the references Chadwich et al. individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, the Examiner respectfully disagrees with the Applicant's argument. Khoury et al. (U.S. Patent No.: 5,532,637) teaches a mixer includes a differential pair of transistors and a variable current to reduce the noise being generated inside the mixer (see figure 3, current control circuit 32, VCC variable current source that add the DC current to a pair of transistors 11, 12 to reduce the noise, col.3, ln.25-67, col.4, ln.1-47). On the other hand, Chadwick teaches a radio receiver includes a band pass filter to reduce the flicker noise being generated by mixer. The band pass filter also can be integrated inside the mixer to reduce the flicker noise (see col.4, ln.35-42).

Base on the above rational, it is believed that the claimed limitations are met by the combination of Khoury and Chadwich and therefore, the rejection are still maintained.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**3. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khoury et al. (U.S. Patent No.: 5,532,637, hereinafter, "Khoury") in view of Chadwick et al. (U.S. Patent No.: 4,628,518, hereinafter, "Chadwick").**

**Regarding claim 1**, Khoury teaches a mixer circuit (see figure 3), comprising: a signal input (see figure 3, I/P2+, I/P2-); an RF transconductance circuit that is configured to convert an input differential signal received at said signal input to a differential current (see figure 3, transistor 11, transistor 12, current I1 flow from transistor 15 to transistor 11, Current I2 flow from transistor 17 to transistor 12, col.3, ln.25-67, col.4, ln.1-47), said RF transconductance circuit having a pair of field effect transistors (see figure 3, transistor 11, transistor 12, col.3, ln.25-67); a LO switching circuit configured to switch said differential current between outputs of said mixer circuit at a rate determined by a differential LO signal (see figure 3, transistors 15-18, O/P+, O/P-, col.3, ln.25-67, col.4, ln.1-47), and a variable current source that adds a DC

current to said pair of field effect transistors in said RF transconductance circuit the DC current adjusted so as to reduce noise being generated inside the mixer circuit (see figure 3, current control circuit 32, VCC variable current source that add the DC current to pairs of transistor 11, 12 to reduce the noise, col.3, ln.25-67, col.4, ln.1-47).

It should be noticed that Khoury fails to teach how to reduce the flicker noise in the mixer. However, Chadwick teaches such feature (see col.4, ln.35-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Chadwick into view of Khoury in order to reduce cost as suggested by Chadwick at column 2, lines 7-12.

**Regarding claim 6**, Khoury teaches a mixer circuit (see figure 3), comprising: a signal input (see figure 3, I/P2+, I/P2-); an RF transconductance circuit that is configured to convert an input differential signal received at said signal input to a differential current (see figure 3, transistor 11, transistor 12, current I1 flow from transistor 15 to transistor 11, Current I2 flow from transistor 17 to transistor 12, col.3, ln.25-67, col.4, ln.1-47) said RF transconductance circuit having a pair of field effect transistors (see figure 7, transistor 11, transistor 12, col.3, ln.25-67); a LO switching circuit configured to switch said differential current between outputs of said mixer circuit at a rate determined by a differential LO signal (see figure 3, transistors 15-18, O/P+, O/P-, col.3, ln.25-67, col.4, ln.1-47); a first variable current source configured to add a first DC current to a first FET of said pair of FETs (see figure 3, first variable current source 25, FET 11, 12); and a second variable current source configured to add a second DC current to a second FET of said pair of FETs (see figure 3, second variable

current source 26, FET 11, 12, col.3, ln.25-67, col.4, ln.1-47, it is inherent that both variable current source 25 and 26 are added the DC current to a pairs of transistor 11 and 12), wherein the first DC current and the second DC current are determined so as to minimize noise being generated inside the mixer circuit (see figure 1, col.3, ln.25-67, col.4, ln.1-47).

It should be noticed that Khoury fails to teach how to reduce the flicker noise in the mixer. However, Chadwick teaches such feature (see col.4, ln.35-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Chadwick into view of Khoury in order to reduce cost as suggested by Chadwick at column 2, lines 7-12.

**4. Claims 5, and 9-10 rejected under 35 U.S.C. 103(a) as being unpatentable over Khoury et al. (U.S. Patent No.: 5,532,637, hereinafter, "Khoury") in view of Chadwick et al. (U.S. Patent No.: 4,628,518, hereinafter, "Chadwick") as applied to claims 1 and 6 above, and further in view of Kung (U.S. Patent No.: 6,037,825).**

**Regarding claims 5 and 9**, Khoury and Chadwick, in combination, fails to teach the mixer circuit wherein said DC current bypasses said LO switching circuit. However, Kung teaches such features (see col.4, ln.35-59).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kung into view of Khoury and Chadwick in order to improve the noise by reducing the DC current as suggested by Kung at column 1, lines 55-59.

**Regarding claim 10**, Kung further teaches the mixer circuit wherein said first DC current is added to a drain of said first FET in said pair of FETs, and said second DC current is added to a drain of said second FET in said pair of FETs (see figure 7, first current 24, second current 25, transistors 11, 12).

## *Conclusion*

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Tuan A. Pham** whose telephone number is (571) 272-8097. The examiner can normally be reached on Monday through Friday, 8:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Curtis Kuntz can be reached on (571) 272-7499 and

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have question on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit 2643
October 19, 2005
Examiner

Tuan Pham

CURTIS KUNTZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600